

Evaluating the role of graduated compression stockings in the prevention of blood clots in patients who undergo short-stay surgery and who are assessed as being low-risk of developing blood clots

Submission date 25/03/2022	Recruitment status No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
Registration date 29/03/2022	Overall study status Ongoing	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
Last Edited 23/09/2025	Condition category Circulatory System	<input type="checkbox"/> Individual participant data <input checked="" type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

Hospital acquired thrombosis is a term used to describe blood clots that may form in the legs and lungs after someone is treated in hospital. A clot in the leg can cause swelling, pain and other long-term problems, such as a leg wound (ulcer). If a clot in the leg breaks off and travels to the lungs, it can cause problems with the lungs' ability to transfer oxygen from the air into the blood and may be life threatening. Having surgery increases a person's risk of developing blood clots. There are a number of reasons for this including being unwell, being unable to move during surgery, and moving around less after surgery. To reduce the chance of a blood clot developing, doctors can give blood-thinning medications and elastic stockings that squeeze the leg muscles.

People having short stay surgery are those who are able to go home the same day or those who stay overnight but go home shortly afterwards. These people are at much lower risk of developing a blood clot than those who stay in hospital for longer. These low-risk people are often given elastic stockings to reduce the chance of developing a blood clot. The risks of wearing the stockings are very low but wearing stockings can be uncomfortable. Occasionally some people with poor blood supply to their feet, can develop wounds on one or both of their feet after wearing elastic stockings, but this is rare.

In the UK, there are over a million short stay surgeries performed each year and most of these people are given elastic stockings to wear. Collectively, these elastic stockings cost the NHS a lot of money and it remains unknown if they benefit these people.

A recent study in a different group of people, who are at higher risk of developing a blood clot and are usually given blood-thinning medications, showed that elastic stockings offered no additional benefit compared to just having blood-thinning medications alone. There are

currently no up to date studies specifically in this group of people that look at whether these elastic stockings reduce the chance of developing a blood clot.

The purpose of this study is to investigate if it is worthwhile to continue using elastic stockings in people having surgery where the risk of developing blood clots is low.

Who can participate?

People enrolled in the study will be over the age of 18 and scheduled to undergo a surgical procedure with a hospital stay less than 48 hours. All participants will be checked for their risk of blood clots when they arrive in hospital for surgery. This study will only include people where the check shows a low risk of developing blood clots, which will be assessed using a nationally recognised tool.

What does the study involve?

At random, participants will be given elastic stockings to wear during their time in hospital or not given elastic stockings at all. The surgery itself and all other processes will continue as normal.

Participants will be contacted (by telephone, email or SMS) at 7 days and 90 days after their surgery to see how they are getting on and to see if they developed a blood clot. Participants will be provided with information on the signs and symptoms of blood clots, such as a swollen painful leg. They will be advised to attend the emergency department if they develop any of the signs and symptoms, and not wait for the follow-up to avoid delay. If the doctors and nurses suspect a participant has developed a blood clot, they will come to hospital for extra tests and treatment which is best practice if a blood clot is suspected.

What are the possible benefits and risks of participating?

Possible benefits: Participants will receive increased education around VTE prevention (i.e. via the 'Signs and Symptoms of a blood clot' leaflet). Both patients and the health service stand to benefit from evidence to support the safe rationalisation of the use of GCS as a health technology.

Possible risks: The risks associated with graduated compression (GCS) use are low, particularly in this patient cohort where the expectation is to wear the stockings for a short period of time (i.e. from the time of surgery until ambulant [which may be as short as a few hours and no longer than 48-hours]). GCS may cause skin irritation and itching. Patients will be advised to speak to their healthcare professional at any point prior to (and indeed after) discharge should they have any concerns. Individuals with a contraindication to wearing GCS will not be included. The relevant participants will also be followed up at 7-days post procedure and information about any adverse events associated with GCS will be captured. We do not expect participation to result in any additional burden on the participant. Participants will be followed-up remotely at 7 and 90-days post-surgical procedure. Data can be provided via online survey, SMS or telephone depending on patient preference. Minimal data collection will occur at these follow-ups (i.e. only self-reported VTE outcome data, the short 5-item EQ-5D questionnaire and information on adverse events associated with GCS [if applicable] is collected at 7-days. At 90-days, only self-reported VTE outcome, the EQ-5D and the resource use questionnaire data is collected).

Where is the study run from?

Imperial College London (UK)

When is the study starting and how long is it expected to run for?

March 2022 to June 2026

Who is funding the study?
National Institute for Health Research (NIHR) (UK).

Who is the main contact?
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2. Prof. Alun Davies (scientific contact), a.h.davies@imperial.ac.uk

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Principal investigator

Contact name

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Additional identifiers

Clinical Trials Information System (CTIS)

Nil known

Integrated Research Application System (IRAS)

312752

ClinicalTrials.gov (NCT)

Nil known

Protocol serial number

IRAS 312752, NIHR133776

Study information

Scientific Title

Examining the benefit of graduated compression stockings in the Prevention of venous Thromboembolism in low-risk Surgical patients: a multicentre cluster randomised controlled trial (PETS Trial)

Acronym

PETS

Study objectives

The principal objective of this study is to evaluate the potential benefit of GCS in the prevention of VTE in patients undergoing short-stay surgical procedures, assessed as being at low-risk for VTE.

Ethics approval required

Old ethics approval format

Ethics approval(s)

Approved 31/05/2022, London - Camden and King's Cross REC (Level 3, Block B, Whitefriars, Lewins Mead, Bristol, BS1 2NT, UK; +44 207 1048089; camdenandkingscross.rec@hra.nhs.uk), ref: 22/LO/0390

Study design

Multicentre cluster randomized controlled trial

Primary study design

Interventional

Study type(s)

Prevention

Health condition(s) or problem(s) studied

Prevention of venous thromboembolism (VTE) in patients who are deemed to be at low-risk of developing VTE and who undergo day-case/short-stay surgical procedures.

Interventions

This is a cluster-designed RCT in which study centres will either be randomised to intervention or control.

Centres randomised to the intervention arm, which is the current standard of care, will consist of participants receiving graduated compression stockings (GCS). Clinical staff (e.g. preassessment

or theatre support workers) will issue stockings to all patients who are scheduled to undergo short-stay surgery. Participants will be instructed to wear their stockings just before undergoing the surgical procedure and to remove the stockings as soon as they are ambulant (i.e. after the procedure).

In those centres randomised to the control arm, participants will not receive graduated compression stockings.

Intervention Type

Behavioural

Primary outcome(s)

Self-reported VTE within 90-days of short-stay surgical procedure.

Key secondary outcome(s)

1. Mortality measured using patient notes and SAE log review at 7 and 90-days
2. Cost-Effectiveness Ratio measured using the Incremental Cost-Effectiveness Ratio (ICER) at 90 days
3. Generic Quality of life (as measured by the EQ-5D) at 7 and 90-days
4. Adverse events with GCS (at 7-days, for participants enrolled in the site randomised to the 'stockings' cluster only) measured using patient records

Completion date

30/06/2026

Eligibility

Key inclusion criteria

1. Adults (18-59 years of age) scheduled to undergo a surgical procedure with a hospital stay <48 hours
2. Individuals assessed as being at low-risk of developing VTE as per the DHRA tool i.e. no assessed thrombosis risk factors / scoring 0

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 years

Upper age limit

59 years

Sex

All

Total final enrolment

11321

Key exclusion criteria

Current exclusion criteria as of 12/09/2024:

1. Individuals with a contraindication to GCS
 2. Individuals assessed as being at moderate or high risk of VTE as per the DHRA tool
 3. Individuals requiring therapeutic anticoagulation
 4. Individuals requiring pharmacological prophylaxis
 5. Individuals with thrombophilia/ thrombogenic disorder
 6. Individuals with a previous history of VTE
 7. Individuals requiring intermittent pneumatic compression therapy beyond theatre and recovery
 8. Female patients of childbearing age who have a positive pregnancy test
 9. Individuals with lower limb immobilisation
 10. Inability to provide informed consent
-

Previous exclusion criteria as of 14/08/2023 to 12/09/2024:

1. Individuals with a contraindication to GCS
 2. Individuals assessed as being at moderate or high risk of VTE as per the DHRA tool
 3. Individuals requiring therapeutic anticoagulation
 4. Individuals with thrombophilia/ thrombogenic disorder
 5. Individuals with a previous history of VTE
 6. Individuals requiring intermittent pneumatic compression therapy beyond theatre and recovery
 7. Individuals requiring extended thromboprophylaxis beyond discharge
 8. Female patients of childbearing age who have a positive pregnancy test
 9. Individuals with lower limb immobilisation
 10. Inability to provide informed consent
 11. Individuals requiring pharmacological prophylaxis
-

Previous exclusion criteria:

1. Individuals with a contraindication to GCS
2. Individuals assessed as being at moderate or high-risk of VTE as per the DHRA tool
3. Individuals requiring therapeutic anticoagulation
4. Individuals with thrombophilia/ thrombogenic disorder
5. Individuals with a previous history of VTE
6. Individuals requiring intermittent pneumatic compression therapy beyond theatre and recovery
7. Individuals requiring extended thromboprophylaxis beyond discharge
8. Female patients of childbearing age who have a positive pregnancy test
9. Individuals with lower limb immobilisation
10. Inability to provide informed consent.

Date of first enrolment

08/09/2022

Date of final enrolment

18/11/2024

Locations

Countries of recruitment

United Kingdom

England

Scotland

Wales

Study participating centre

North Bristol NHS Trust

Southmead Hospital

Southmead Road

Westbury-on-trym

Bristol

United Kingdom

BS10 5NB

Study participating centre

Epsom and St Helier University Hospitals NHS Trust

St Helier Hospital

Wrythe Lane

Carshalton

United Kingdom

SM5 1AA

Study participating centre

Hull University Teaching Hospitals NHS Trust

Hull Royal Infirmary

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HU3 2JZ

Study participating centre

Nottingham University Hospitals NHS Trust - Queen's Medical Centre Campus

Nottingham University Hospital

Derby Road

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NG7 2UH

Study participating centre
Guy's and St Thomas' Hospitals
Trust Offices
Guy's Hospital
Great Maze Pond
London
United Kingdom
SE1 9RT

Study participating centre
University Hospitals of Leicester NHS Trust
Leicester Royal Infirmary
Infirmary Square
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LE1 5WW

Study participating centre
Mid and South Essex NHS Foundation Trust
Prittlewell Chase
Westcliff-on-sea
United Kingdom
SS0 0RY

Study participating centre
Cardiff & Vale University Health Board
United Kingdom
CF14 4XW

Study participating centre
Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust
Doncaster Royal Infirmary
Armthorpe Road
Doncaster
United Kingdom
DN2 5LT

Study participating centre

Portsmouth Hospitals University NHS Trust
United Kingdom
PO6 3LY

Study participating centre
Royal Free London NHS Foundation Trust
Royal Free Hospital
Pond Street
London
United Kingdom
NW3 2QG

Study participating centre
University College London Hospitals NHS Foundation Trust
250 Euston Road
London
United Kingdom
NW1 2PG

Study participating centre
North West Anglia NHS Foundation Trust
Peterborough City Hospital
Bretton Gate
Bretton
Peterborough
United Kingdom
PE3 9GZ

Study participating centre
Imperial College Healthcare NHS Trust
The Bays
St Marys Hospital
South Wharf Road
London
United Kingdom
W2 1BL

Study participating centre
London North West University Hospitals
Watford Road
Harrow

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HA1 3UJ

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Frimley Health NHS Foundation Trust
Portsmouth Road
Frimley
Camberley
United Kingdom
GU16 7UJ

Study participating centre
Leeds Teaching Hospitals NHS Trust
St. James's University Hospital
Beckett Street
Leeds
United Kingdom
LS9 7TF

Study participating centre
Sheffield Teaching Hospitals NHS Foundation Trust
Northern General Hospital
Herries Road
Sheffield
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S5 7AU

Study participating centre
Somerset NHS Foundation Trust
United Kingdom
TA1 5DA

Study participating centre
University Hospitals Coventry and Warwickshire NHS Trust
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United Kingdom
CV2 2DX

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Hampshire Hospitals NHS Foundation Trust
Basingstoke and North Hampshire Hos
Aldermaston Road
Basingstoke
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RG24 9NA

Study participating centre
Hywel Dda Health Board
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St Davids Parc
Job's Well Road
Carmarthen
United Kingdom
SA31 3BB

Study participating centre
York and Scarborough Teaching Hospitals NHS Foundation Trust
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Wigginton Road
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United Kingdom
YO31 8HE

Study participating centre
North Tees and Hartlepool NHS Foundation Trust
University Hospital of Hartlepool
Holdforth Road
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United Kingdom
TS24 9AH

Study participating centre
University Hospital Southampton NHS Foundation Trust
Southampton General Hospital
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SO16 6YD

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St George's University Hospitals NHS Foundation Trust
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SW17 0QT

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Barts Health NHS Trust
The Royal London Hospital
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E1 2ES

Study participating centre
Cambridge University Hospitals NHS Foundation Trust
Cambridge Biomedical Campus
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CB2 0QQ

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Chelsea and Westminster Hospital NHS Foundation Trust
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North Cumbria Integrated Care NHS Foundation Trust
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Study participating centre

University Hospitals Dorset NHS Foundation Trust

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Study participating centre

The Newcastle upon Tyne Hospitals NHS Foundation Trust

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Swansea Bay University Local Health Board

One Talbot Gateway, Seaway Drive

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Baglan

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Study participating centre

NHS Greater Glasgow and Clyde

J B Russell House
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Sherwood Forest Hospitals NHS Foundation Trust

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Study participating centre

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Study participating centre

Blackpool Teaching Hospitals NHS Foundation Trust

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Kettering General Hospital NHS Foundation Trust
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Sandwell and West Birmingham Hospitals NHS Trust
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B18 7QH

Study participating centre
South Tyneside and Sunderland NHS Foundation Trust
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Study participating centre

University Hospitals Bristol and Weston NHS Foundation Trust

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Study participating centre

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Study participating centre

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Study participating centre

Cleveland Clinic London

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United Kingdom

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Study participating centre

NHS Ayrshire and Arran

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Study participating centre

University Hospitals Sussex NHS Foundation Trust

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Study participating centre

Mersey and West Lancashire Teaching Hospitals NHS Trust

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Study participating centre

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Sponsor information

Organisation

Imperial College London

ROR

<https://ror.org/041kmwe10>

Funder(s)

Funder type

Government

Funder Name

National Institute for Health Research

Alternative Name(s)

National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

Funding Body Type

Government organisation

Funding Body Subtype

National government

Location

United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

Data sharing statement to be made available at a later date.

IPD sharing plan summary

Data sharing statement to be made available at a later date

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article		17/01/2023	19/01/2023	Yes	No
HRA research summary			28/06/2023	No	No
Protocol file	version 2.0	18/07/2022	13/10/2022	No	No
Protocol file	version 3.0	29/11/2022	14/08/2023	No	No
Protocol file	version 7.0	07/05/2024	12/09/2024	No	No
Study website	Study website	11/11/2025	11/11/2025	No	Yes